Installing an Egress Window in an Existing Foundation

With the right equipment, you can cut the opening and install the well in a day

by Mark Shafer

Photos courtesy Wellcraft except where noted

Even though I'd been remodeling basements for 25 years, I wasn't prepared for my first basement egress window installation. After hand-digging the window well, I had to call in a concrete-cutting company to cut the opening, then rent a jackhammer to break up the large slab of concrete left behind. Lifting the broken concrete out of the 5-foot hole and moving it — along with 4 yards of heavy clay — to my pickup in a wheelbarrow wasn't any fun; neither was wheelbarrowing in a truckload of pea-stone backfill. It was four days before I could even start installing the window.

That was back in 2003. At the time, Michigan had just expanded egress-window code requirements to include all habitable below-grade spaces, not just bedrooms. Anticipating the demand that the code change would create, I began to look into ways to make the job

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Figure 1. The author starts most egress wells by digging a 6-foot-deep hole roughly 6 feet long and 4 feet wide (above left). He then hand-digs down another foot or so to uncover the foundation's perimeter drain (above). A flexible 4-inch perforated pipe (left) teed into the perimeter drain provides drainage at the bottom of the well.

easier. Within a year, I had invested in excavating and concrete-cutting equipment and began specializing in egress window installations.

Today my brother Michael and I can complete a basic egress window well in about eight hours. It's all we do: We install about three units per week and work year-round. While I prefer sunny 60°F days with a light breeze, we also work in February when it's 10°F out and the ground is frozen. Over the last four years, we've installed more than 600 egress windows.

Equipment and Tools

When I show up at a job site, I'm driving a 6-yard dump truck and pulling a 10-ton tag trailer. In the truck, I'm carrying 3 yards of 3/8-inch-diameter pea-stone backfill; on the trailer, I have my Bobcat, a backhoe attachment, a set of forks, and a standard bucket. I've also got 32 sheets of 3/4-inch plywood that I use to protect the homeowner's yard, a 6-foot-wide by 8-foot-long by 2-foot-high steel pan for holding dirt, an escape window and well, and various other materials and tools needed for installation.

To cut the concrete, I bought a Dimas WS325 track-mounted wall saw (now sold in the U.S. as the Husqvarna WS325; 800/288-5040, us.husqvarnacp.com). It's fitted with a 28-inch-diameter blade that allows us to make straight and square cuts through a 12-inch-thick poured wall. I go through a couple of these $1,200 diamond blades per year.

Once the track is mounted on the foundation wall, a hand crank advances the saw trolley; compared with a hand-held ring saw, this machine is really easy on the back. It's powered with a Husqvarna HP40 hydraulic power pack.

To avoid having to overcut the corners, I've also invested in an ICS 853Pro Series concrete-cutting chain saw (800/321-1240, icsbestway.com). This water-cooled tool has a 15-inch bar and is also powered by the hydraulic power pack. It has a diamond chain that unfortunately can't be sharpened; I use about one $650 chain per month.

My initial investment in saws, blades, and the power pack was about $25,000. I

Figure 2. A water-cooled hydraulic wall saw is used to cut through the foundation wall. First, the author attaches mounting brackets to the wall with wedge bolts (above left). Then he assembles the saw and makes the first cut at the bottom (above). A wedge driven into the bottom cut holds the slab in place while he makes the two side cuts (far left). The corners are completed with a hydraulically powered concrete chain saw (left).

spent another $100,000 on the used dump truck, a custom trailer, and the Bobcat and attachments.

Escape-Well Options

I install many different types of escape wells, including custom designs built with pressure-treated timbers or landscaping block, and manufactured systems from Bilco (203/934-6363, bilco.com) and Boman Kemp (800/733-7886, boman-kemp.com). But most of the wells I install are from Wellcraft (888/812-9545, wellcraftwells.com). Made from polyethylene, they're virtually maintenance-free and have a curb appeal that makes them easy to sell when I display them at home shows. I've installed more than 500 Wellcraft units without a callback, with models 2062 and 5600 being the most popular.

Each of our installations includes a polycarbonate cover, which allows light to come through while keeping debris, leaves, toads, snakes, and people from falling into the 5-foot-deep well. Wellcraft's covers come in both flat and dome styles (depending on the well model) and are rated to hold 350 to 500 pounds. For added security, a steel grate and a lattice cover are available for Wellcraft's 5600 model.

Excavation

Before arriving on site, we always contact Miss Dig, Michigan's statewide utility marking system. But Miss Dig doesn't find sprinkler lines, so after removing the sod from the well site by hand, I always dig a 12-inch-deep exploratory trench around the perimeter. If I find any lines, I cut and crimp them (to keep them free of dirt), then reroute them around the well.

While I'm doing this, my brother Michael unloads the Bobcat and lays plywood on the lawn from the road to the window site to protect the grass. When we excavate the hole, we place the dirt in the dirt pan, which also protects the landscaping and makes cleanup easier (**see Figure 1, page 2**).

Drainage

Of the hundreds of houses where we've installed egress windows, only two haven't had any perimeter drainage. In

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Figure 3. Even though the saws are water-cooled, overspray on the inside of the basement is minimal; a sheet of plastic funneled to a 5-gallon bucket provides plenty of protection (far left). Once the cut is completed, the slab is lifted out of the hole with the Bobcat (left).

those cases, the homes were located on sites with sandy soil and no history of basement moisture, so we simply dug a little deeper and wider and used more pea stone — making a dry well, in effect. But usually we tee into the existing drain line. If there are any unforeseen below-grade situations, our standard contract specifies that additional drainage (at an extra charge) may be required.

Before we start sawing, I use pea stone to backfill around the drain pipe and cover the bottom of our hole. That way, we won't be cutting concrete while standing in mud, even if it starts to rain.

Cutting Concrete

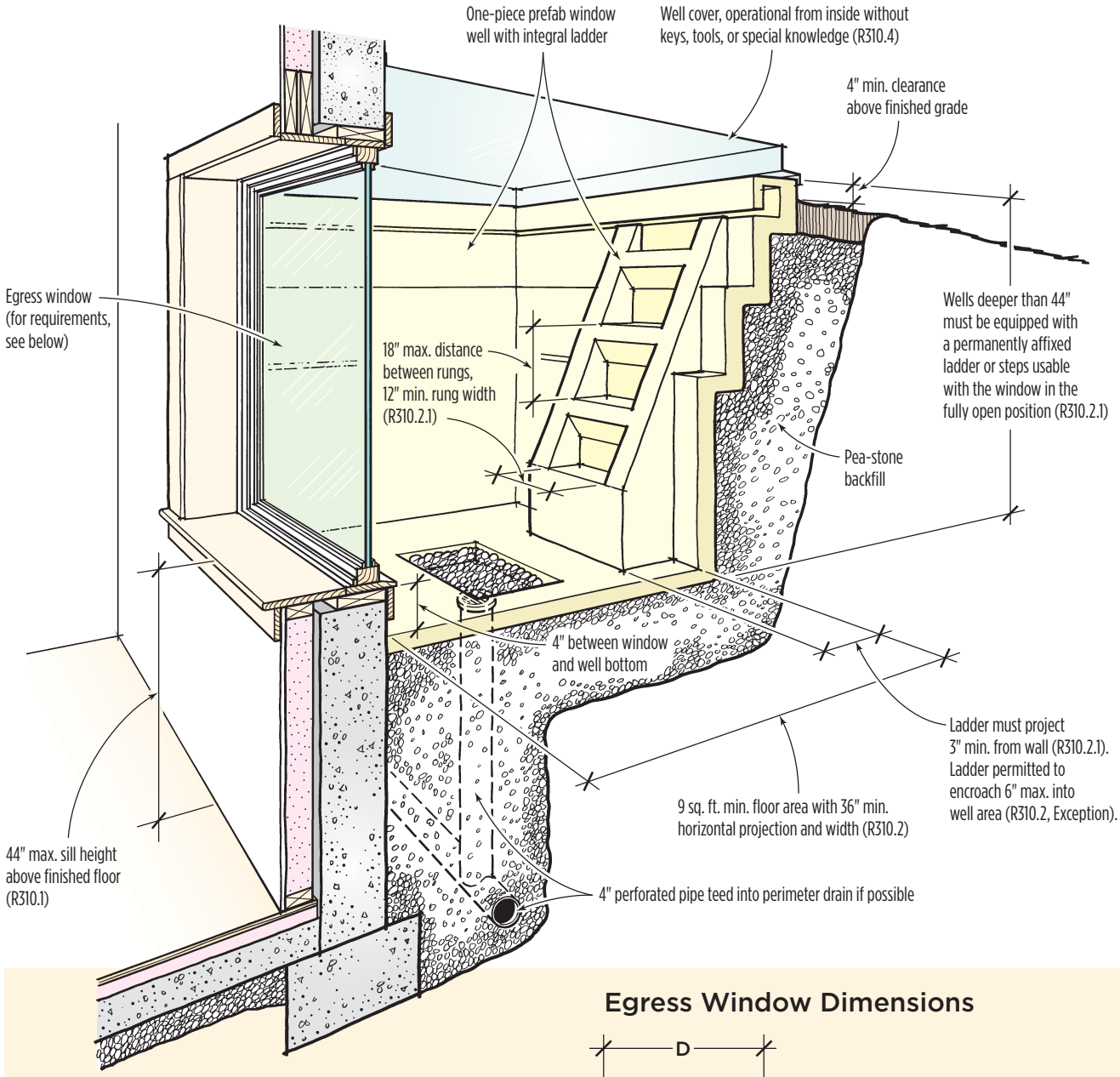
Most of the time, we're installing the new egress window where there's already a small window — generally one that's 32 inches wide by 14 inches high. When we lay out the new opening, we look for obvious obstructions in the basement, like plumbing and utility lines and beam pockets. We avoid putting egress windows too close to driveways (where car tires can roll over them) or under bay windows.

Typically we make a three-cut opening,

Figure 4. Prefabricated window wells are available in one-piece or stackable modular units to fit a range of egress window sizes (left). They're bolted to the foundation wall (inset) and sealed inside and outside with caulk, then carefully backfilled with pea stone for good drainage (below).

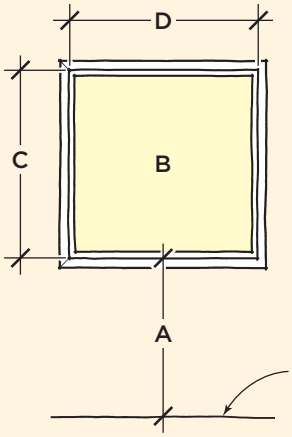
Code Requirements for Window Wells

References from 2006 IRC, Section R310; other labels based on author's preferred practice



Egress Window Dimensions

Below-grade egress windows must have a minimum 5.7-square-foot net-clear opening that is at least 20 inches wide and 24 inches high. A 20-inch-wide window opening, for example, would have to be 42 inches high to meet most codes.



A = 44" max. sill height (R310.1)

B = 5.7 sq. ft. min. net-clear opening (R310.1.1)

C = 24" min. net-clear height (R310.1.2)

D = 20" min. net-clear width (R310.1.3)

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Figure 5. Window frames are constructed of 2-by PT stock (above left), which is fastened to the masonry with expanding foam sealant (above, top) and powder-actuated fasteners (above). Wider openings may also require a header, and a brick lintel may need to be installed to support brick veneer (left).

all the way up to the sill plate. By code, the window sill height can't be more than 44 inches above the floor; most of our windows have a 32-inch clearance, a height that's better for kids (**see illustration, page 5**).

We lay out the cut on the outside of the wall, usually measuring off the existing window. On a blind layout where clearances are critical, we'll drill a pilot hole through the wall and use that as a benchmark. If a structural header is required, we temporarily prop up the floor joists with 2x4s as we cut the opening.

While Michael mounts the track and assembles the saw outside (**Figure 2, page 3**), I hang plastic inside the basement to help contain water and overspray (**Figure 3, page 4**). The plastic funnels toward a 5-gallon bucket, which is large enough for most jobs. When there's carpeting inside, I put down self-stick plastic carpet protector and, over that, a layer of poly for extra insurance.

We make the bottom cut first, then pound a chisel in the opening to keep the piece of concrete wedged in place. Next we make the two side cuts — or, if we happen to be making four cuts, a side cut, the top cut, and then the other side cut. We use our concrete chain saw to finish the corner cuts. For a typical job, setting up and cutting out the opening takes about two hours.

After Michael completes the cuts, I slowly pry the concrete block out into the

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Figure 6. To flash the opening, the author installs stock L-shaped aluminum flashing at the sill before putting in the window (above) and laps the wall's WRB over the nailing flange after the window is installed (right).

excavation from inside the basement. It's heavy: A 32-inch-by-49-inch-by-10-inch block weighs 1,600 pounds. We wrap a chain around it and lift it out with the Bobcat. Afterward, we wash and clean the concrete wall with water and a stiff brush.

Window Wells

When we install an egress window well, we always make sure that the well has a minimum 4-inch clearance above finished grade and that there are at least 4 inches between the bottom of the window and the bottom of the well (**Figure 4, page 4**). I fasten wells to masonry using 3/8-inch-by-3 3/4-inch wedge bolts with 1 1/2-inch fender washers. Most well flanges are predrilled for the fasteners — typically 8 inches on-center — and I make sure to use every hole. To seal the flanges to the foundation wall, I run beads of NPC's Solar Seal 900 caulking (800/654-1042, npcsealants.com) on both the inside and outside of the well.

I backfill the inside of the well with pea stone to within a few inches of the bottom cut, then cut the 4-inch drainpipe riser flush with the stone and attach the drain cover to the pipe.

We backfill the outside of the well with pea stone to within 6 inches of final grade, using the Bobcat to move the stone and placing it slowly and evenly to prevent damage to the well. Rectangular wells (like the Bilco ScapeWel) need to be braced while backfilling to prevent them from deforming. The last 6 inches get backfilled with top soil, with the finished grade sloped away from the house. If we removed any sod before digging, we replace it around the well.

Installing the Window

We build frames with pressure-treated 2-bys and attach the frames to the masonry with 2 1/2-inch Remington power fasteners (**Figure 5, page 6**). We use Solar Seal 900 to seal the frames to the walls and expanding foam to fill any larger gaps.

If there's brick veneer and we've enlarged the opening, we'll install a brick lintel and patch in the brick. On wider openings we may need to install a header.

At the sill, we install 1 1/4-inch-by-1 1/4-inch aluminum L-flashing, which covers the concrete and runs up the 2-by framing (**Figure 6**). Before installing the window, we slip peel-and-stick flashing behind the house's existing weather-resistive barrier.

We caulk the nailing flange before installing the window, and finish it with 3/4-inch-thick by 1 1/2-inch PVC trim. When installed, the face of the trim is inset about 1/2 inch from the outside face of the foundation wall.

I usually install an all-vinyl egress window called the Escape Window (Astro Building Supplies, 313/291-5900, escapewindows.net). It looks like a double-hung and functions as a single-hung, but it's hinged so the entire frame swings open into the basement (**Figure 7, page 8**). It comes in custom sizes, but for wider openings, Andersen's vinyl-clad 200 Series sliders (800/426-4261, andersenwindows.com) also make good egress windows.

We finish up by installing the polycarbonate well cover. Flat covers attach to the back of the well and are hinged to tilt up. Their fronts are held in place with Velcro, which makes them easy to remove from inside. Domed covers — which lift off in one piece — are also attached to the well with Velcro.


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Figure 7. For standard openings, the author installs an all-vinyl egress window (far left), which is hinged to provide an easy exit (left). Vinyl-clad sliders are a good choice for wider openings (below left). For low maintenance, he finishes egress windows with PVC trim and installs a well cover (below), which is sold in both flat and domed versions.

Before leaving, we scoop the excavated dirt out of the dirt pan with the Bobcat and load it in the dump truck, along with the block of concrete. We always have people looking for free fill — and a local masonry supply company has a crushed concrete plant, so there's no charge to drop off the block.

JLCEXTRA

To see photos of some of the author's custom egress window wells, go to jlconline.com and click on the JLC Extra tab.

After packing up the plywood, raking the yard, and loading up the truck and trailer with our equipment and tools, we're ready to head home.

Cost

To install Wellcraft's 2062 well — the company's smallest model — with a flat cover and an Astro 28-inch-by-46-inch Escape egress window, we charge about $3,400 (plus a permit fee ranging between $35 and $270). For a 5-foot opening — where we'd use an Andersen 200-series slider and a Wellcraft 2067 well — the cost would be about $4,400.

Custom jobs may cost $7,500 or more, because they usually take two or three days longer and use landscaping blocks and timbers that are more expensive than prefab wells.

Most of our business comes from within a 100-mile radius, or about a two-hour drive. Our Web site generates roughly 60 percent of our customers; the rest come from home shows, yard signs, word of mouth, and referrals from other clients and basement remodeling contractors.

Mark Shafer *owns Egress Solutions in Leonard, Mich.*